

Laboratory Medicine Best Practices (LMBP) Initiative Update

Clinical Laboratory Improvement Advisory Committee Meeting August 30, 2012



**Nancy E. Cornish MD,
CDC Division of Laboratory Science and Standards**

Office of Surveillance, Epidemiology, and Laboratory Services
Laboratory Science, Policy and Practice Program Office



The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Questions for CLIAC Consideration

- ❑ How can we generate new topics for discovery of laboratory best practices?
- ❑ What topic suggestions do you have?
- ❑ How can laboratory professionals become more engaged in quality improvement studies that...
 - advance on-site laboratory improvements?
 - support the broader evidence base for systematic reviews?
- ❑ What additional tutorials would help laboratory professionals learn about evidence-based practices and quality improvement study strategies?
- ❑ How can we more broadly communicate/disseminate best practices recommendations?

Previous Presentations To CLIAC

Date	Presenter	Affiliation
Sept 2006	Dr. Joe Boone	CDC
Feb 2007	Dr. Julie Taylor	CDC
Sept 2007	Dr. Susan Snyder	CDC
Sept 2008	Dr. Joe Boone	CDC
Feb 2009	Dr. Ed Liebow	Battelle
March 2011	Dr. Robert Christenson, Ms. Diana Mass	LMBP Workgroup



History/Goals

- ❑ CDC initiative, beginning in 2006 with contract assistance from Battelle
- ❑ Establish and use **transparent, systematic** review methods to evaluate evidence of laboratory practice effectiveness, especially in the pre- and post-analytical phases
- ❑ Improve healthcare quality and patient outcomes* through dissemination of evidence reviews of effectiveness which identify evidence-based laboratory medicine “best practices”
- ❑ Increase participation of laboratory professionals in quality improvement research and data collection

*Following Institute of Medicine's quality domains: safe, timely, effective, efficient, equitable, and patient-centered

www.futurelabmedicine.org

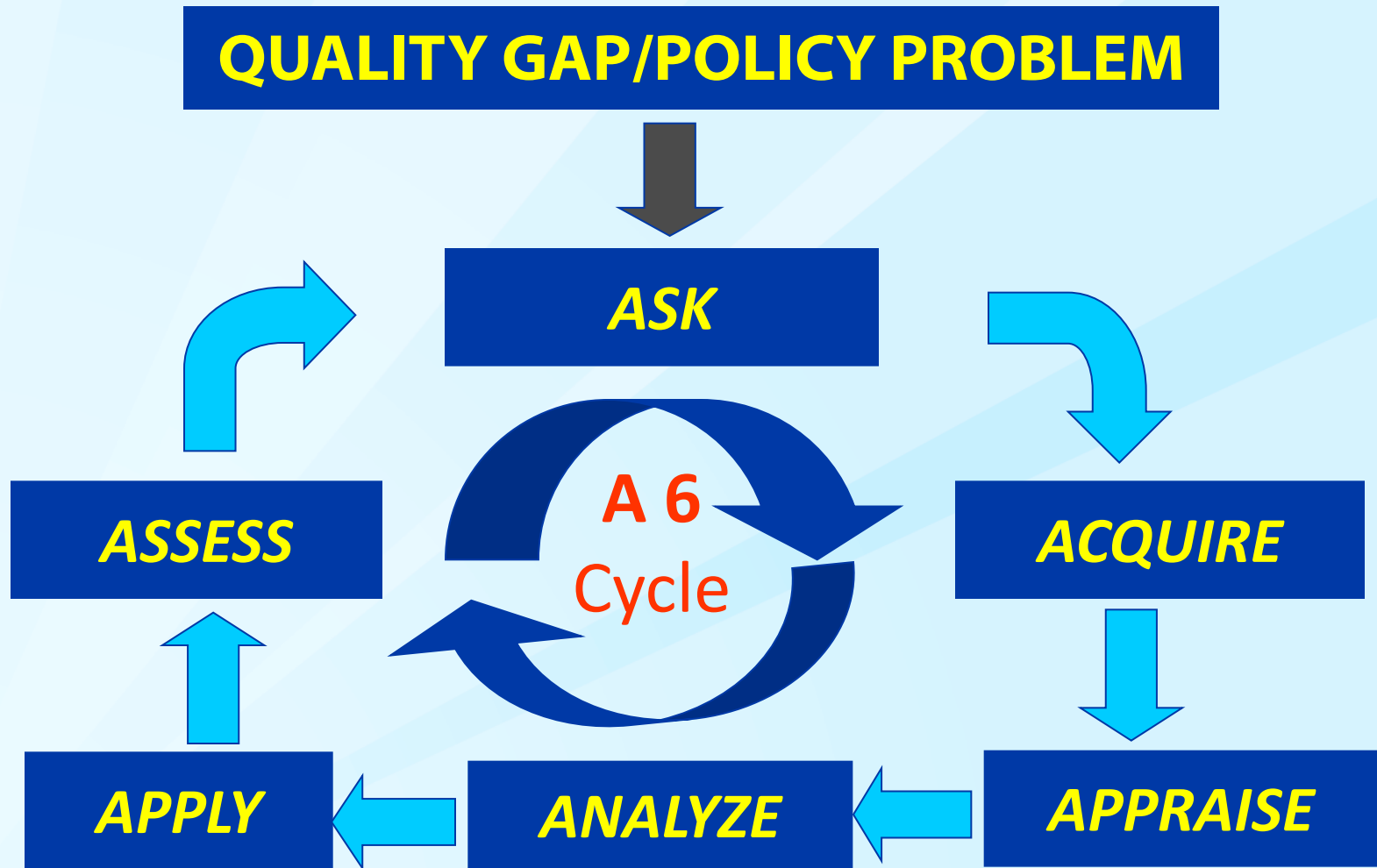
Information and Activities:

- Tutorials, technical reports, systematic review findings
- Calls for evidence and for review topics
- Announcements of publications and meeting presentations

The screenshot displays the website for the Laboratory Medicine Best Practices Network. At the top left, the logo reads "LABORATORY MEDICINE" in a bold, sans-serif font, with "Best Practices" in a green, cursive script below it. To the right of the logo is a login section with labels "User Name" and "Password" above two input fields, and a "Log In" link below the first field. A horizontal navigation bar with orange tabs contains the following links: "ABOUT US", "GET INVOLVED", "OUR METHODS", "OUR FINDINGS", "LEARNING", and "CONTACT US". The "GET INVOLVED" tab is active, showing a dropdown menu with the options: "Register", "Data Submission", "Suggest Topics", "Network", and "Public Comments". The main content area features a large image of a scientist in a white lab coat and purple gloves working with a pipette. To the right of this image is a smaller image of laboratory glassware. Below the glassware image, the text "The Laboratory Medicine Best Practice Network" is displayed, followed by a red "REGISTER" button with a right-pointing arrow. At the bottom of the main content area, there is an orange bar with the text "News and Announcements" and a right-pointing arrow. The footer at the very bottom includes the "Best Practices" logo and a small graphic of three colored circles (red, yellow, blue) connected by lines.

LMBP A6 Method

Clin. Chem. June 2011, Vol. 57(6): 816-825. Epub Apr 22, 2011



Accomplishments

2011-2012

Four Published Reviews, 2012

- ❑ *Effectiveness of Barcoding for Reducing Patient Specimen and Test Identification Errors: A Laboratory Medicine Best Practices Systematic Review and Meta-Analysis.* [Snyder SR, Favoretto AM, Derzon JH, Shaw C, Baetz RA, Christenson RH, Mass D, Fantz C, Raab S, Tanasijevic M, Kahn S, Liebow EB.] Clinical Biochemistry.
<http://dx.doi.org/10.1016/j.clinbiochem.2012.06.019>
- ❑ *Effectiveness of Practices to Reduce Blood Culture Contamination: A Laboratory Medicine Best Practices Systematic Review and Meta-Analysis* [Snyder SR, Favoretto AM, Baetz RA, Derzon JH, Madison B, Mass D, Shaw C, Layfield C, Christenson R, Liebow EB] Clinical Biochemistry.
<http://dx.doi.org/10.1016/j.clinbiochem.2012.06.007>

Published Reviews, 2012, cont'd

- ❑ *Effectiveness of Automated Notification and Customer Service Call Centers for Timely and Accurate Reporting of Critical Values: A Laboratory Medicine Best Practices Systematic Review and Meta-Analysis* [Fontanesi J, Derzon JH, Favoretto AM, Baetz RA, Shaw C, Thompson P, Mass D, Christenson R, Snyder SR, Epner P, Liebow EB] Clinical Biochemistry. [doi:10.1016/j.clinbiochem.2012.06.023](https://doi.org/10.1016/j.clinbiochem.2012.06.023)
- ❑ *Effectiveness of Practices to Reduce Blood Sample Hemolysis in Emergency Departments: A Laboratory Medicine Best Practices Systematic Review and Meta-Analysis* [Heyer NJ, Derzon JH, Wings L, Shaw C, Mass D, Snyder SR, Epner P, Nichols JH, Gayken JA, Ernst D, Liebow EB] Clinical Biochemistry, [doi:10.1016/j.clinbiochem.2012.08.002](https://doi.org/10.1016/j.clinbiochem.2012.08.002),

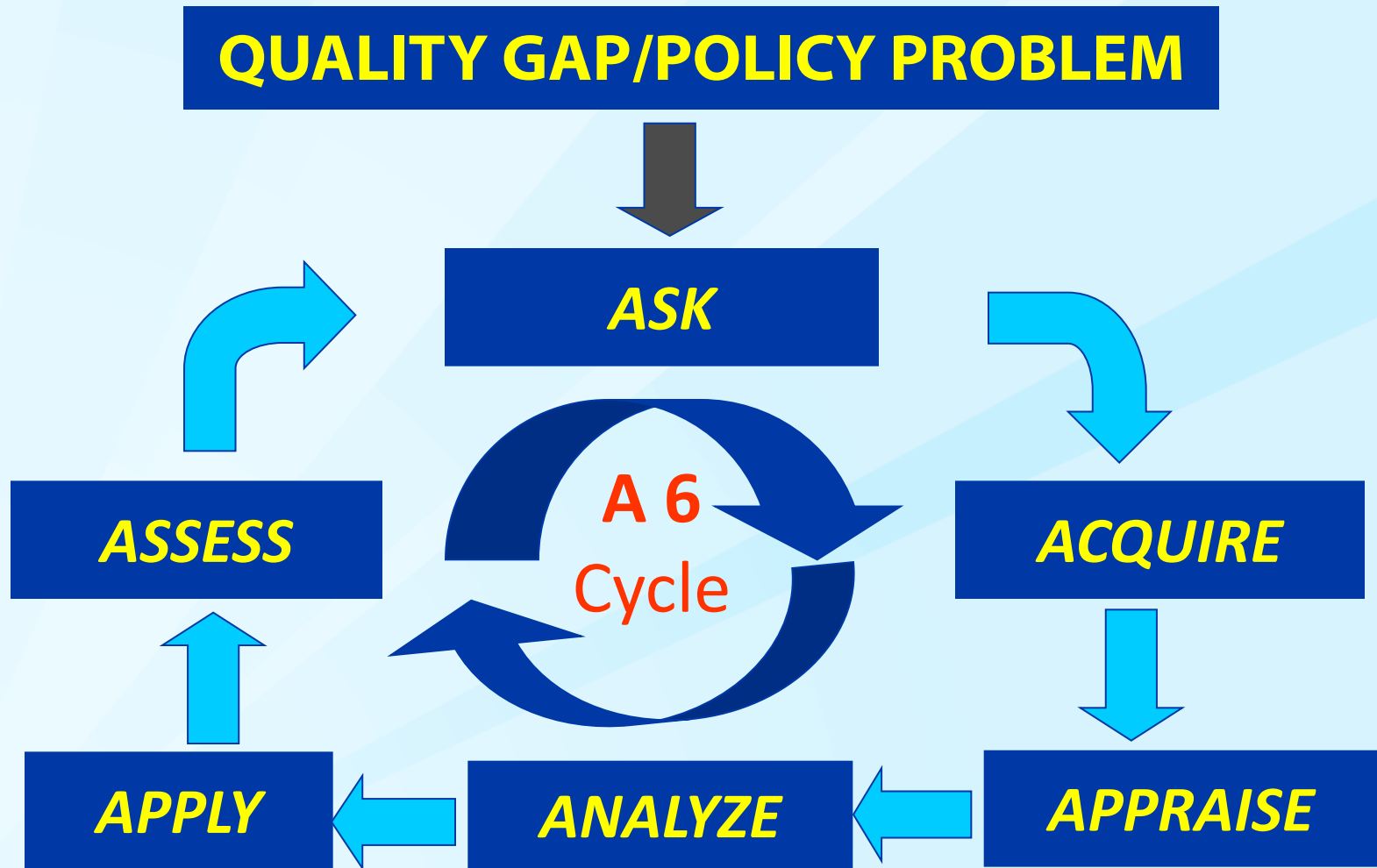
Systematic Reviews In Progress

- ❑ Use of Cardiac Biomarkers to Diagnose N-STEMI Myocardial Infarction in the Emergency Department
- ❑ American Society for Microbiology (ASM) Collaboration projects
 - Rapid diagnosis of blood stream infections
 - Urine collection and transport
 - *C. difficile* diarrhea diagnosis

Systematic Reviews In Progress in Conjunction with ASM

- ❑ Blood stream infections- Rapid Diagnostic Methods - conducted by CDC/Battelle with ASM expertise (At "Analyze" Step)
- ❑ Urine Transport - conducted by ASM with CDC guidance (At "Acquire" Step)
- ❑ *Clostridium difficile* - planned by ASM with CDC guidance (Starting "Ask" Step)

Evidence Based Approach-Systematic Reviews And The ASM Collaboration



CDC & ASM Collaboration Timeline

Date	Event/Activity	Comments
May 2010	LMBP presentation at ASM annual meeting	ASM leadership identified team to select & prequalify topics (ASM 7)
Feb 2011	ASM-CDC-Battelle workshop	Training on A6 method; ASM selected 3 topics
2011-2012	ASM staff/volunteers "shadow" review process for 1 st topic	Rapid ID of blood stream infection review near completion
2012 -	ASM collaborating with CDC on 2 nd topic	Urine collection and transport
2013 -	ASM takes lead for 3 rd topic in collaboration with CDC	<i>C.difficile</i> diarrhea diagnosis

LMBP Team-ASM 7 with CDC/Battelle



CDC & ASM Collaboration

□ ASM

- Committed to A-6 method; may supplement Cumitechs
- Will publish findings in *Clinical Microbiology Reviews*
- *New* 'Evidence-based Practice Guidelines Committee' (per ASM Professional Practice Committee) includes "ASM 7"
- Dr. Mark LaRocco hired as Review Coordinator for ASM Expert Panel's systematic review work
- Librarian hired to support literature searches

□ CDC

- Liaisons - ensure fidelity to A-6 methods
- LMBP workgroup - reviews findings and recommends best practices

Systematic Review Topic Pipeline

Calling for suggestions:

- ❑ on LMBP website
- ❑ when presenting LMBP projects at meetings
- ❑ from LMBP Workgroup
- ❑ from CDC and Battelle staff
- ❑ ***from CLIAC members***

Topic Identification and Selection Process: Guiding Principles

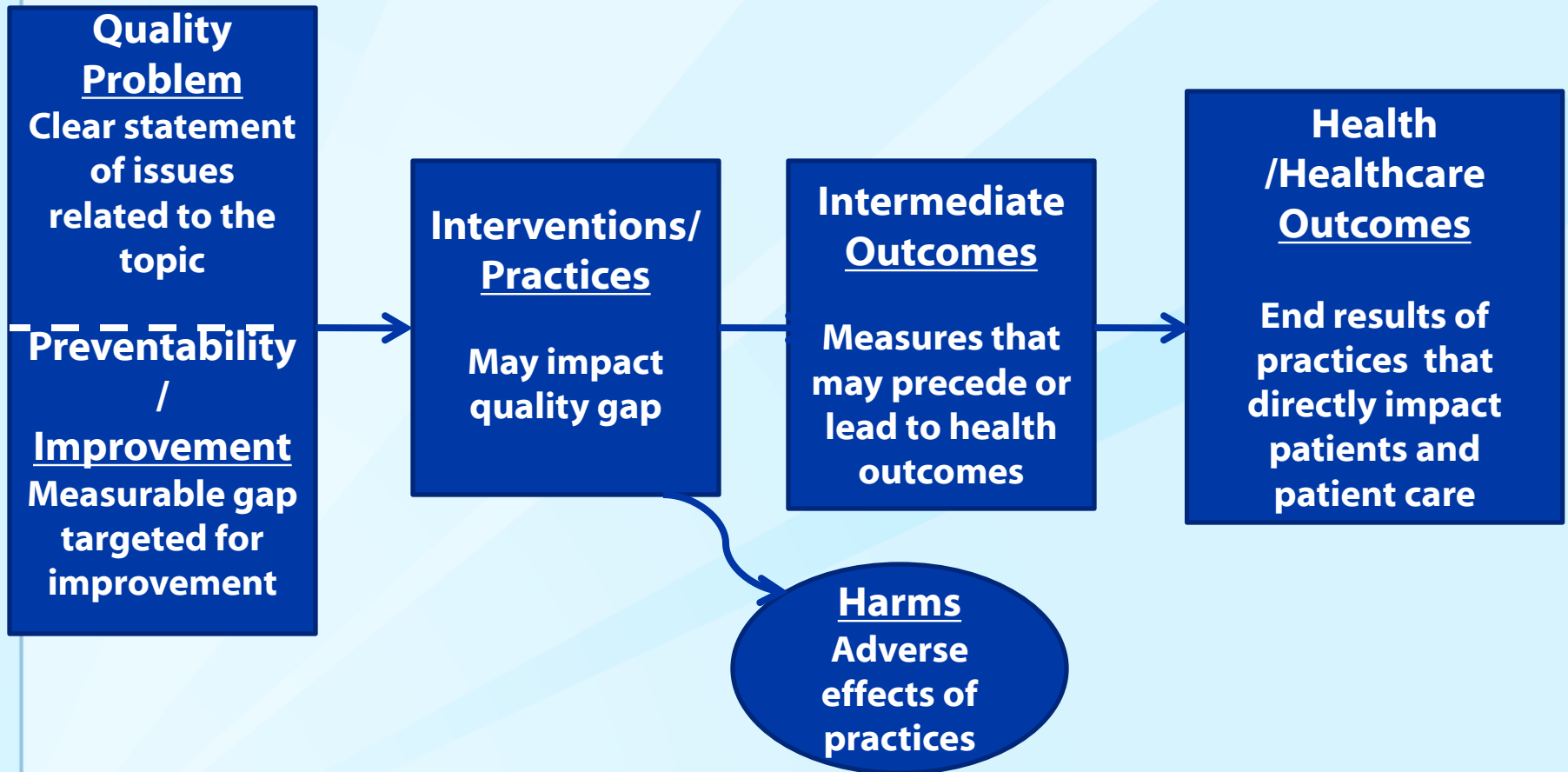
- ❑ Define a quality issue with an opportunity for improvement consistent with the **six** IOM healthcare quality aims*
- ❑ Frame it with **one**, focused review question for a defined patient population
- ❑ Identify at least **three** practices with potential to improve performance or quality outcomes associated with the defined quality issue

* **Safe, Timely, Effective, Efficient, Equitable , and Patient-centered**

Topic Identification and Selection Process: Guiding Principles

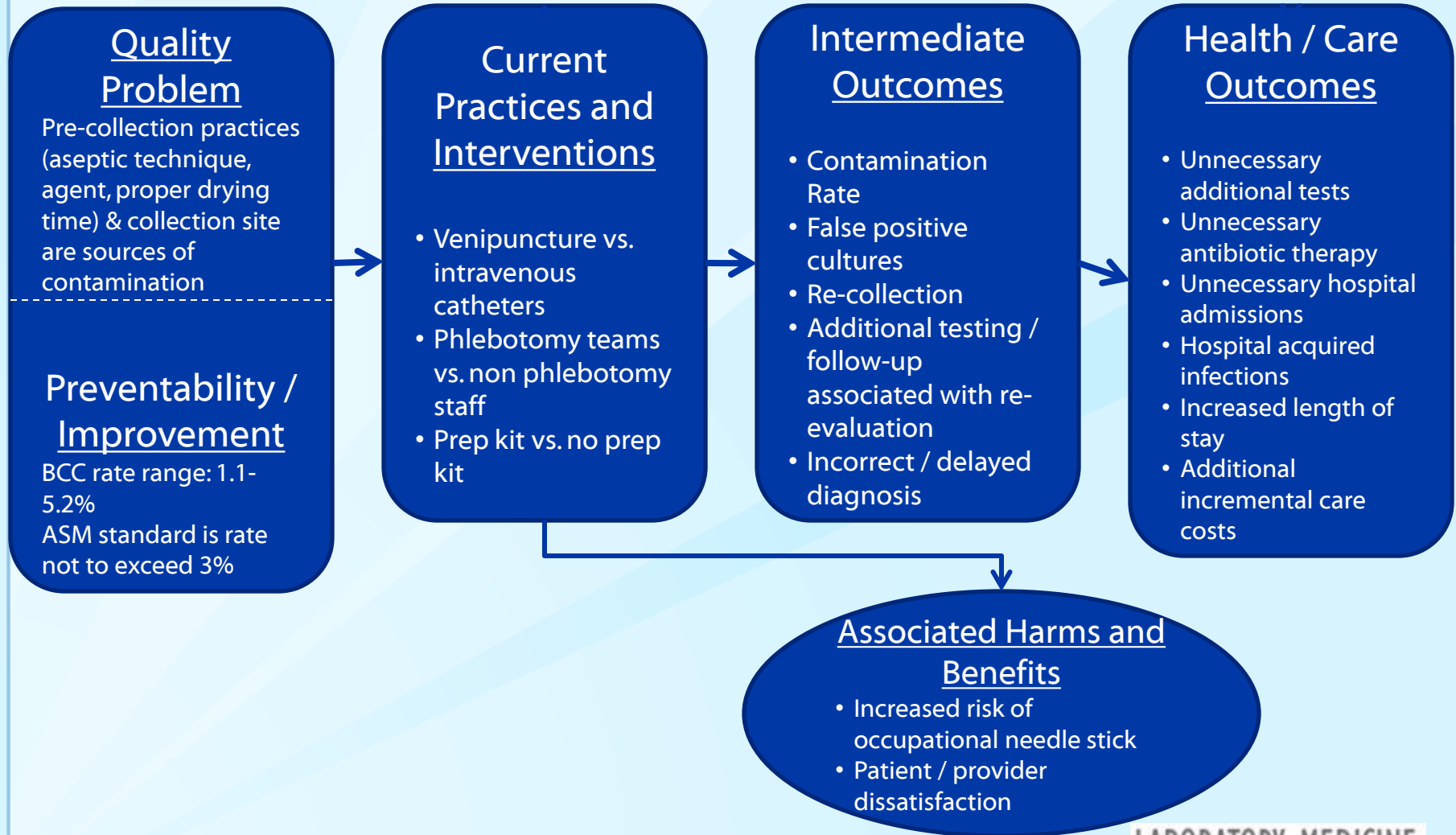
- ❑ Target outcome measures to assess practice effectiveness and have broad, stakeholder interest
- ❑ Evidence for effectiveness should be available from published sources (unpublished sources also possible using A-6)
- ❑ Prefer topics that are pre- and post-analytic issues
 - areas of most significant quality challenges

The LMBP Analytic Framework- ASK Step



ASK Step

Review Question: Among hospitalized patients, what practices are effective for reducing blood culture contamination?



Topics in the Pipeline- for Pre-qualification

- ❑ Lipid profile testing in cardiovascular disease patients
- ❑ Using HbA1c/measurement as a diagnostic tool
- ❑ Coagulation testing/ hypercoagulation panel
- ❑ Effective diagnosis of sepsis
- ❑ Reflex molecular testing in microbiology
- ❑ Reducing blood utilization

Additional Lessons Learned

LMBP A6 Methods also evaluate quality improvement practices from **un**published data

- ❑ Builds the laboratory medicine evidence base
- ❑ Provides relevant data for systematic evidence reviews
- ❑ Data = evidence of practice effectiveness
- ❑ However, *Many studies fail to meet minimum standards for good study design and implementation – **Why?***

Common Quality Improvement Study Problems

Information commonly missing in laboratory medicine quality improvement projects (communications and journal articles)

- ❑ Sample description
- ❑ Sample selection
- ❑ Data collection method
- ❑ Statistical methods
- ❑ Intervention
- ❑ Outcome measure
- ❑ Time period
- ❑ Cause and effect

Common Quality Improvement Study Problems, continued

- ❑ Frequently,
 - fewer than 3 articles published on same topic
 - probably due to journal's desire for unique articles
 - at least 3 studies are needed for statistical significance
- ❑ Special groups of patients missing from studies; e.g., children (children are not little adults)

LMBP Educational Activity

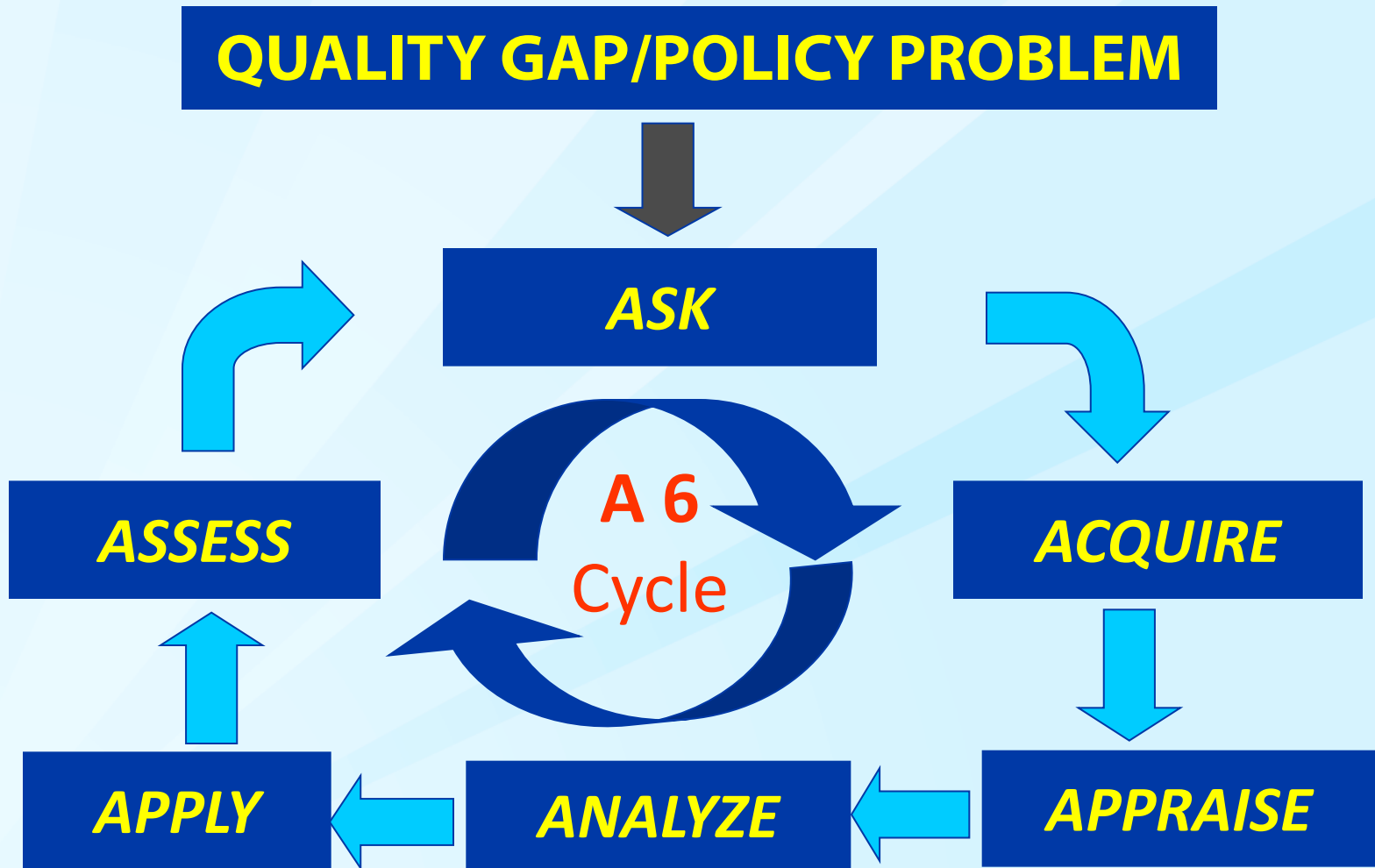
A series of self-guided tutorials
(with CE credit) which:

- ❑ Increase awareness about new LMBP A-6 methods for conducting systematic evidence reviews
- ❑ Increase competency for application of evidence-based principles to quality improvement (QI) projects or research

On-Line Training for Evidence-Based Laboratory Practice

- ❑ Module 1: An Overview of A-6 Methods- *in use by the laboratory community*
<https://www.futurelabmedicine.org>
- ❑ Module 2: Application of A-6 Methods for Laboratory Practitioners – near completion
- ❑ Additional Modules: Concepts pending
 - > Ideas from CLIAC members are welcomed

Future Focus : Apply (A5) and Assess (A6)



“Apply”

- ❑ Apply step (A5) involves dissemination and implementation of new practice in the field
- ❑ IOM states that it takes up to 17 years for a new guideline to become standard practice
- ❑ How can more rapid adoption be encouraged?

“Assess”

- ❑ Assess step (A6) measures the impact of the best practice recommendation on laboratory practice
 - collect measurement /data
 - submit to LMBP website
- ❑ How should QI projects be designed
 - to meet standards for systematic review
 - for inclusion in practice recommendation
 - to support A-6 cycle completion

Future Focus: QI Study Tools

Completed systematic reviews = templates for QI projects in other clinical laboratories

- ❑ Optimal study design featured in Discussion of published LMBP recommendations
- ❑ Optimal study design Checklist includes all required elements discovered during previous systematic review of topic
- ❑ Optimal study design and Checklist are on LMBP website “QI project in a box”
- ❑ Recruit clinical laboratory sites to participate in study using “QI project in box” model

Develop A Checklist With Required Elements For Systematic Review

LMBP Hemolysis in the ED - Quality Improvement (QI) Project/Study Summary Form

(Note: Please complete separate form for each study/evaluation you conducted)

Background Information	QI Project/Study	QI Practice	Outcome Measures	Results/Findings
<p>LMBP Topic: Hemolysis in the ED</p> <p>1. Problem/Quality Issue Description A. Practices (check all that apply): <input type="checkbox"/> Straight need venipuncture vs. IV start <input checked="" type="checkbox"/> Antecubital fossa vs. distal arm <input type="checkbox"/> Large vs. small gauge needle/catheter <input type="checkbox"/> Low vs. full vacuum tubes <input type="checkbox"/> Syringe vs. tube when using IV start <input type="checkbox"/> Duration of applied tourniquet <input type="checkbox"/> Other – Describe: _____</p> <p>B. Personnel (check all that apply): <input type="checkbox"/> Lab phlebotomist vs. ED staff <input type="checkbox"/> Training vs. no special training for ED staff <input type="checkbox"/> Other – Describe: _____</p> <p>2. Submitter(s) and Org. Affiliations: _____</p> <p>3. Study Dates Completed/Submitted: Completed: _____ Reported on Web? (Where? Date?) _____</p> <p>Submitted to LMBP (Date): _____</p> <p>4. Funding Source(s): <input type="checkbox"/> In-house <input type="checkbox"/> Manufacturer: Describe: _____ <input type="checkbox"/> Grant/Contract: Describe: _____ <input type="checkbox"/> Other – Describe: _____</p>	<p>5. QI Project Study Design/Type: <input type="checkbox"/> Observational <input type="checkbox"/> Pre-post implementation <input type="checkbox"/> Split implementation (multiple sites) <input type="checkbox"/> Case - Control <input type="checkbox"/> Randomized assignment <input type="checkbox"/> Other Please Describe checked design: _____</p> <p>6. Facility Description (include size): <input type="checkbox"/> Hospital: Type/N Beds: _____ <input type="checkbox"/> Other – Describe: _____</p> <p>7. QI Project/Study Setting: <input type="checkbox"/> Emergency Department <input type="checkbox"/> Other – Describe: _____</p> <p>8. Overall Project/Study Timeframe (include pilot projects): Start & End Dates: _____ Please Describe: _____</p> <p>9. Study Sample/Population (size and description – describe if different between compared practices) _____</p>	<p>10. Describe Usual Practice: _____</p> <p>11. Describe Alternate/Intervention Practice: _____</p> <p>12. Intervention Duration Dates (pilot, pre/post, etc.) – List each phase with start and end dates: Describe Phases: _____</p> <p>13. Resource Requirements/Costs: A. Staff / Training: _____</p> <p>B. Equipment/Supplies: _____</p> <p>C. Other: _____</p>	<p>14. Outcome Measure(s) Description: <input type="checkbox"/> Hemolysis Rate (How determined?) _____ <input type="checkbox"/> Other – Describe: _____</p> <p>15. Recording method (how data was collected / note any differences between standard and test practices): <input type="checkbox"/> Logs of occurrence <input type="checkbox"/> Incident / adverse events reports <input type="checkbox"/> Audit – direct observation <input type="checkbox"/> Electronic information system monitoring <input type="checkbox"/> Other Please Describe each checked method: _____</p> <p>16. Potential Sources of bias: <input type="checkbox"/> Patient characteristics: difficult / poor veins / severity of injury <input checked="" type="checkbox"/> Triage of staff <input type="checkbox"/> Gauge of needle/catheter <input type="checkbox"/> Number of tubes drawn at once <input type="checkbox"/> Other – Describe: _____</p>	<p>17. Results/Findings as (related to study design/outcome measure): _____</p> <p>18. Data Analysis – Statistics: <input type="checkbox"/> Simple Association (not controlling non-test variables) <input type="checkbox"/> Associations controlling for other variables <input type="checkbox"/> Rate Comparisons between two groups <input type="checkbox"/> Other Please Describe each checked method: _____</p> <p>19. Data Analysis-Significance <input type="checkbox"/> For Pearson correlations <input type="checkbox"/> F-Test <input type="checkbox"/> T-Test <input type="checkbox"/> Fischer Exact <input type="checkbox"/> Chi-square <input type="checkbox"/> Other Please Describe each checked method: _____</p> <p>20. Conclusions: _____</p>

You can "check" boxes by double left clicking on them. If you do not have room to fill in the answer, use the next page and refer to question number.

Questions for CLIAC Consideration

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Interested in LMBP?

Register at:

<https://www.futurelabmedicine.org>



Receive notification of:

- ☐ Availability of technical reports, review findings, tutorials
- ☐ Calls for evidence, topics, public feedback
- ☐ Announcements of publications and meeting participation